

CASE STUDY ON AORTIC DISSECTIONSumara Rehman¹, Hajra Sarwar²

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Contribution

SR conceived the idea and designed the case report. Final drafting and review was done by HS. Both authors contributed equally to the submitted case report.

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ABSTRACT

Aortic dissection is rare disorder and have fatal results if it remains undiagnosed or mistreated. A 31-year-old adult came in emergency with chest pain and having medical history of hypertension and family history of ischemic heart disease. Pain relieved by nitro-glycerine. After further investigations like echocardiography and CT Angiography it was diagnosed as aortic dissection type A and decided for Bentall procedure beating heart surgery. After surgery the results were normal, and patient recovered completely.

Key Words: Aortic dissection, ischemic heart disease, Bentall procedure.

INTRODUCTION

Aortic dissection is a fatal condition in which there is a tear in the intimal layer of aorta, the major artery pumping blood out of heart. As the flap in the aorta extend blood can flow in the both layers of vessel in which dissection is present. This condition can lead to rupture of aorta due to forceful flow of blood in the aorta. When flap occurs in the aorta or separation of layer in the aorta, it generates two ways: first, the blood is continuously pumping to the body and the second, blood remain in that part of aorta.¹

Aortic dissection is a rare disease and life-threatening results may occur if treatment is delayed or mis diagnosis. General population who have aortic dissection disorder is ranged from 2.6 to 3.5 per 100,000 person per year. The quick and accurate diagnosis of aortic dissection can improve the quality of life of patient.²

Bentall procedure is used to treat the patient of aortic dissection, improve the condition of patient and minimize the risk of post-operative complications. In 1968, Bentall and De Bono first time introduce the surgical technique how to reconstruct the aortic root with a valve composite graft. The size of graft which is mostly used is 24mm.³

The uniqueness of the case is that Bentall procedure performed when blood flowing in aorta at low pressure, this is called beating heart surgery. In 1968, the Bentall procedure was selected as artificial vessel replacement in aorta and achieve good results. The beating heart surgery is performed as warm blood retrograde infusion in coronary sinus and with mild hypothermia pulmonary bypass. In this procedure the heart is beating during operation with oxygenated blood. This procedure decreases the reperfusion injury and tolerate the myocardial energy metabolism during this procedure when aorta is clamped. This study explores the beating heart surgery of Bentall procedure in clinical experience.⁴

CASE REPORT

A 31-year-old patient came to the emergency department of public hospital with chest pain, and patient explained that he was bearing pain from 24 hours, dated 19 February 2019. He was having family history of ischemic heart disease. He was a medical history of hypertension, one day before coming to the hospital he felt severe chest pain. His receiving vital signs were as follows; B. P 156/100 mmHg, pulse 96/m, temperature 37C, R/R 22/m, SPO 80%. ECG finding was normal. On x-ray finding mediastinum widening. Murmurs heard on chest. Nitro-glycerine was given sublingual, gave oxygen therapy and maintained the position of patient to make comfortable. Patient shifted to the ICU for further management. Patient was having stress related symptoms like fear of death and altered sleep and rest pattern. Haematological examination included, Hb% 8.6 g/l, WBC 14.5 g/l, total RBC 3.3 million. HCT (PCV) 26%. Platelets 135 x 10⁹/l. Neutrophils 85%. Lymphocytes 12%. Monocytes 02%. Eosinophil 1%. Biochemistry includes, Blood glucose random 100 mg/dl. Cardiac enzymes are altered; CK-MB is 64 LVL more than normal, CPK is 1150 LVL more than normal. Liver function test are also altered; total bilirubin 0.3 g/dl, ALT (SGPT) 35 LVL. Total protein 4.5 g/dl, serum albumin 2.2 g/dl, A/G Ratio is 01. Serum electrolytes findings were also altered and as follows; sodium 145 mmol/L, potassium 4.8 mmol/L normal, calcium 7.2

mg/dl below normal, serum phosphorus 3.2 mg/dl normal, magnesium 2.9 mg/dl above normal. Renal function test was in normal range. Blood urea 28 mg/dl normal. Serum creatinine 0.8 mg/dl. On echocardiography patient is reported as normal right atrium. Normal right ventricle and function. left atrium compressed 16 mm, and dilated aortic root 80 mm, left ventricle dilated 16 mm with visible dissection flap in ascending aorta. According to Computerize Tomography (CT) report a red blood clot was seen that was compressing the lumen of aorta. This was due to high pressure of blood. The condition was diagnosed as type A Aortic Dissection. After viewing and analysing all reports surgeon decided to perform Bentall procedure. After surgery the aortic root replaced by aortic graft of 35.7 mm of diameter. No evidence of dissection flap in computerize tomography (CT) after surgery. No evidence of pericardial effusion. With normal coronary arteries, normal replaced aortic root was reported. Medication which was given to the patient was beta blockers and nitroprusside and patient was discharged after 14 days.

DISCUSSION

In this case report 31-year-old male admitted with chest pain which was initially considered as angina pain. The pain was treated with nitroglycerine sublingual because it causes vasodilation and help to minimize the pressure of blood on vessels walls. Pain of aortic dissection is sharp and tearing with abrupt onset. Later it was diagnosed as aortic dissection through echocardiography and computerize tomography. On family history patient has hypertension and CHF.²

The major risk factor for aortic dissection is hypertension in 72% of cases in young adults less than 40 year of age. Other risk factors include cardiovascular surgery, atherosclerosis, iatrogenic injury due to aortic catheterization, aortic dissection may also occur due to infection like syphilis. Use of cocaine and methamphetamine, thinning of aortic wall, sternum exercises may also cause aortic dissection. The aortic dissection may also due to inherited diseases like Marfan syndrome, familial aortic dissection and turner syndrome are the risk factor of aortic dissection.²

Aortic dissection is rare in young age and in healthy person. A healthy, active athlete person may also develop aortic dissection type A, not due to hypertension, chest trauma, atherosclerosis, or heredity but due to long term use of anabolic steroids associated with heavy weightlifting. Symptoms occur tearing chest pain radiated to back and worse with exertion.⁵

Aortic dissection occurs with tearing pain, but rarely it presents with painless symptoms and difficult to diagnose. It develops with neurologic complication like paraplegia. Paraplegia develops in the intercostal arteries may occur from temporary obstruction of blood flow to spina cord and arteries. It includes history of cardiac surgery, loss of pulses, sensory and motor function and the alteration of CK-MB, Troponin level.⁷

Initially chronic aortic dissection was treated with endovascular stent grafting or repair. It is safe, effective, and less invasive than open heart surgery. This procedure is done with a thin tube (delivery catheter) It strengthens the aorta to rupture the damaged area. No complication monitor during procedure.⁸

Management of aortic dissection for type A and B is medical

therapy to relieve the pain and decrease hypertension. Beta blockers and calcium channel blockers are used. In aortic dissection surgical procedure is performed for prevention from aortic rupture and aortic regurgitation. Cardiopulmonary bypass is performed for type A aortic dissection. Stroke, renal failure, and mediastinal bleeding are complication of surgery of aortic dissection.⁹

Bentall procedure has excellent result while using for aortic root replacement. It is widely applicable due to its successful results. Two types of valves are used mechanical and biological, but anticoagulant used whole life with it. Patient shows minimum rate of complication like bleeding and emboli. The mechanical valve root grafting is guaranteed and 1st choice of younger patients for long lasting treatment and minimum incidence of complication like thromboembolism.¹⁰

CONCLUSION

Consequently, in this case presentation patient with aortic dissection has symptoms of tearing chest pain, sometime painless symptoms. It diagnosed through echocardiography and CT and cardiac enzymes. Risk factor involve hypertension, heredity and anabolic steroids. So the treatment of aortic dissection is Bentall procedure. It is innovative treatment for aortic dissection with low complication and increasing the quality of life.

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